

PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
Marco NAHMIAS NANNI et al.)
)
Serial No.: Not yet assigned) Group Art Unit: Not yet assigned
)
Filed: June 12, 2001) Examiner: Not yet assigned
)
For: PROCESS FOR PRODUCING)
TYRES, TYRES THUS OBTAINED)
AND ELASTOMERIC)
COMPOSITIONS USED THEREIN)

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

Prior to the examination of the above-captioned application, please amend this
application as follows:

IN THE SPECIFICATION:

Please amend the specification, as follows:

Add two section headings, a section subheading, and a paragraph immediately after the
title PROCESS FOR PRODUCING TYRES, TYRES THUS OBTAINED AND
ELASTOMERIC COMPOSITIONS USED THEREIN, as follows:

--CROSS-REFERENCES TO RELATED APPLICATIONS

0987406 064790
This application is a continuation of International Patent Application No. PCT/EP99/09646, filed December 6, 1999, in the European Patent Office; additionally, Applicants claim the right of priority under 35 U.S.C. § 119(a) - (d) based on patent application No. 98124373.6, filed December 22, 1998, in the European Patent Office; further, Applicants claim the benefit under 35 U.S.C. § 119(e) based on prior-filed, copending provisional application No. 60/116,237, filed January 15, 1999, in the U.S. Patent and Trademark Office; the contents of all of which are relied upon and incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention--

Page 1, line 4, add section subheading --Description of the Related Art-- prior to the start of the paragraph beginning "Processes for vulcanizing diene elastomers"

Page 4, line 28, add section heading --SUMMARY OF THE INVENTION-- prior to the start of the paragraph beginning "The Applicant has now found"

Page 20, line 14, add section heading --BRIEF DESCRIPTION OF THE DRAWINGS-- prior to the start of the paragraph beginning "The present invention will now be further"

Page 20, line 24, add section heading --DETAILED DESCRIPTION OF THE
PREFERRED EMBODIMENTS-- prior to the start of the paragraph beginning "With reference
to Fig. 1"

Add a new Page 40 after the claims, adding the following ABSTRACT OF THE
DISCLOSURE. A new, separate Page 40 including the ABSTRACT OF THE DISCLOSURE is
enclosed.

--ABSTRACT OF THE DISCLOSURE

A process for producing tyres for vehicle wheels includes making a raw tyre including at
least one crosslinkable elastomeric material, molding the raw tyre in a molding cavity defined in
a vulcanization mold, and crosslinking the elastomeric material by heating the tyre to a
predetermined temperature for a predetermined time, wherein the raw tyre includes at least one
crosslinkable elastomeric material having an elastomeric polymer containing epoxide groups and
an active filler containing hydroxyl groups dispersed in the elastomeric polymer, and wherein the
crosslinking step is carried out essentially without additional crosslinking agents. A related
composition, process for producing the composition, manufactured product, and tyre are also
disclosed.--

IN THE CLAIMS:

Please cancel, without prejudice or disclaimer, claims 1-54, and add new claims 55-108,
as follows:

--55. (new) A process for producing tyres for vehicle wheels, the process comprising the steps of:

making a raw tyre comprising at least one crosslinkable elastomeric material;

molding the raw tyre in a molding cavity defined in a vulcanization mold; and

crosslinking the elastomeric material by heating the tyre to a predetermined temperature for a predetermined time;

wherein the raw tyre comprises at least one crosslinkable elastomeric material comprising an elastomeric polymer containing epoxide groups and an active filler containing hydroxyl groups dispersed in the elastomeric polymer, and wherein the crosslinking step is carried out essentially without additional crosslinking agents.

56. (new) The process of claim 55, wherein the crosslinking step is carried out by heating the tyre to a maximum temperature of at least 100°C for at least 3 minutes.

57. (new) The process of claim 56, wherein the crosslinking step is carried out by heating the tyre to a maximum temperature of at least 120°C for at least 5 minutes.

58. (new) The process of claim 55, wherein the active filler is dispersed in the elastomeric polymer containing epoxide groups with a dispersion index greater than 90%.

59. (new) The process of claim 58, wherein the active filler is dispersed in the elastomeric polymer containing epoxide groups with a dispersion index greater than 95%.

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60. (new) The process of claim 59, wherein the active filler is dispersed in the elastomeric polymer containing epoxide groups with a dispersion index greater than 98%.

61. (new) The process of claim 55, wherein the at least one crosslinkable elastomeric material has an effective degree of crosslinking equal to at least 65% after no more than 5 minutes of heating at 170°C.

62. (new) A composition comprising an elastomeric polymer containing epoxide groups and an active filler containing hydroxyl groups dispersed in the elastomeric polymer, the composition being crosslinkable essentially without additional crosslinking agents and having an effective degree of crosslinking equal to at least 65% after no more than 5 minutes of heating at 170°C.

63. (new) The composition of claim 62, wherein the active filler is dispersed in the elastomeric polymer containing epoxide groups with a dispersion index greater than 90%.

64. (new) The composition of claim 63, wherein the active filler is dispersed in the elastomeric polymer containing epoxide groups with a dispersion index greater than 95%.

65. (new) The composition of claim 64, wherein the active filler is dispersed in the elastomeric polymer containing epoxide groups with a dispersion index greater than 98%.

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66. (new) The composition of claim 62, wherein the elastomeric polymer containing epoxide groups is a homopolymer or copolymer with elastomeric properties having a glass transition temperature less than 23°C.

67. (new) The composition of claim 66, wherein the elastomeric polymer containing epoxide groups has a glass transition temperature less than 0°C.

68. (new) The composition of claim 62, wherein the elastomeric polymer contains at least 0.05 mol% of epoxide groups relative to a total number of moles of monomers present in the elastomeric polymer.

69. (new) The composition of claim 68, wherein the elastomeric polymer contains from 0.1 mol% to 70 mol% of epoxide groups relative to the total number of moles of monomers present in the elastomeric polymer.

70. (new) The composition of claim 69, wherein the elastomeric polymer contains from 0.5 mol% to 60 mol% of epoxide groups relative to the total number of moles of monomers present in the elastomeric polymer.

71. (new) The composition of claim 62, wherein the elastomeric polymer has a mean molecular weight between 2,000 and 1,000,000.

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72. (new) The composition of claim 71, wherein the elastomeric polymer has a mean molecular weight between 50,000 and 500,000.

73. (new) The composition of claim 62, wherein the elastomeric polymer is an epoxidized diene homopolymer or copolymer, in which a base polymer structure is derived from one or more conjugated diene monomers, optionally copolymerized with monovinylarenes, polar comonomers, or monovinylarenes and polar comonomers.

74. (new) The composition of claim 73, wherein the base polymer structure is derived from natural rubber, polybutadiene, polyisoprene, styrene/butadiene copolymers, butadiene/isoprene copolymers, styrene/isoprene copolymers, nitrile rubbers, or mixtures thereof.

75. (new) The composition of claim 62, wherein the elastomeric polymer is a copolymer of one or more monoolefins with an olefinic comonomer containing one or more epoxide groups.

76. (new) The composition of claim 62, wherein the elastomeric polymer is a mixture with one or more non-epoxidized elastomeric polymers.

77. (new) The composition of claim 62, wherein the active filler is silica, precipitated silica, pyrogenic silica, alumina, titanium oxide, cellulose fibres, microcrystalline cellulose, zeolites, kaolin, or mixtures thereof.

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78. (new) The composition of claim 77, wherein the active filler is precipitated silica, pyrogenic silica, alumina, or mixtures thereof.

79. (new) The composition of claim 62, wherein the active filler is a filler whose surface is modified with hydroxyl groups.

80. (new) The composition of claim 79, wherein the active filler is carbon black at least partially coated with silica.

81. (new) The composition of claim 62, wherein a surface area of the active filler is greater than $40 \text{ m}^2/\text{g}$.

82. (new) The composition of claim 81, wherein the surface area of the active filler is between $80 \text{ m}^2/\text{g}$ and $600 \text{ m}^2/\text{g}$.

83. (new) The composition of claim 62, wherein the active filler has a density of active hydroxyl groups greater than $1 \text{ group}/\text{nm}^2$.

84. (new) The composition of claim 83, wherein the active filler has a density of active hydroxyl groups greater than $5 \text{ groups}/\text{nm}^2$.

85. (new) The composition of claim 62, wherein the active filler is present in an amount greater than 20 phr.

86. (new) The composition of claim 85, wherein the active filler is present in an amount between 30 phr and 150 phr.

87. (new) The composition of claim 62, wherein the active filler is mixed with one or more non-active reinforcing fillers.

88. (new) The composition of claim 87, wherein the active filler is at least 50%-by-weight of total filler present in the composition.

89. (new) The composition of claim 62, further comprising one or more of the following additives: antioxidants, protective agents, plasticizers, adhesives, anti-ozonizing agents, curing resins, modifying resins, and fibres.

90. (new) The composition of claim 62, further comprising a lubricant.

91. (new) The composition of claim 90, wherein the lubricant is present in an amount between 2 phr and 100 phr.

92. (new) The composition of claim 91, wherein the lubricant is present in an amount between 5 phr and 50 phr.

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93. (new) A process for preparing an elastomeric composition comprising an elastomeric polymer containing epoxide groups and an active filler containing hydroxyl groups dispersed in the elastomeric polymer, the elastomeric composition being crosslinkable without additional crosslinking agents, the process comprising the step of mixing the active filler with the elastomeric polymer for a predetermined time, to obtain a degree of dispersion of the active filler greater than 90%, and at a predetermined temperature, to avoid pre-crosslinking of the elastomeric composition.

94. (new) The process of claim 93, wherein a temperature of the mixing step is kept below 130°C.

95. (new) The process of claim 94, wherein the temperature of the mixing step is kept below 100°C.

96. (new) The process of claim 95, wherein the temperature of the mixing step is kept below 80°C.

97. (new) The process of claim 93, wherein the active filler and the elastomeric polymer are mixed using an open mixer.

98. (new) The process of claim 93, wherein the active filler and the elastomeric polymer are mixed using an internal mixer.

99. (new) The process of claim 93, wherein the active filler and the elastomeric polymer are mixed using a continuous mixer.

100. (new) The process of claim 97, 98, or 99, wherein a time of the mixing step is greater than 90 sec.

101. (new) The process of claim 100, wherein the time of the mixing step is between 3 minutes and 35 minutes.

102. (new) A process for preparing an elastomeric composition comprising an elastomeric polymer containing epoxide groups and an active filler containing hydroxyl groups dispersed in the elastomeric polymer, the elastomeric composition being crosslinkable without additional crosslinking agents, the process comprising the steps of mixing the active filler with the elastomeric polymer in the form of an aqueous emulsion or a solution in an organic solvent, and then separating out by precipitation a mixture of the active filler and the elastomeric polymer.

103. (new) A crosslinked manufactured product comprising an elastomeric polymer containing epoxide groups and an active filler containing hydroxyl groups dispersed in the elastomeric polymer, wherein the manufactured product is crosslinked essentially without additional crosslinking agents, and wherein the active filler is dispersed in the elastomeric polymer with a dispersion index greater than 90%.

104. (new) The product of claim 103, wherein the active filler is dispersed in the elastomeric polymer containing epoxide groups with a dispersion index greater than 95%.

105. (new) The product of claim 104, wherein the active filler is dispersed in the elastomeric polymer containing epoxide groups with a dispersion index greater than 98%.

106. (new) The product of claim 103, obtained by crosslinking, essentially without additional crosslinking agents, a composition comprising an elastomeric polymer containing epoxide groups and an active filler containing hydroxyl groups dispersed in the elastomeric polymer, the composition having an effective degree of crosslinking equal to at least 65% after no more than 5 minutes of heating at 170°C.

107. (new) A tyre for vehicle wheels, comprising one or more components made of crosslinked elastomeric material, wherein at least one of the components comprises a crosslinked elastomeric material comprising an elastomeric polymer containing epoxide groups and an active filler containing hydroxyl groups dispersed in the elastomeric polymer, the elastomeric material being crosslinked essentially without additional crosslinking agents.

108. (new) The tyre of claim 107, wherein the crosslinked elastomeric material is obtained by crosslinking, essentially without additional crosslinking agents, a composition comprising an elastomeric polymer containing epoxide groups and an active filler containing hydroxyl groups dispersed in the elastomeric polymer, the composition having an effective degree of crosslinking equal to at least 65% after no more than 5 minutes of heating at 170°C.--

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REMARKS

Applicant submits this Preliminary Amendment together with a continuation application under 37 C.F.R. § 1.53(b). Claims 1-54 are pending in this application.

In this Amendment, Applicant adds section headings, section subheadings, and an Abstract of the Disclosure to conform to U.S. practice. Additionally, Applicant adds claims to the right of priority and benefit. Further, Applicant cancels, without prejudice or disclaimer, claims 1-54, and add new claims 55-108, which include the same subject matter as the original claims, to improve clarity. The originally-filed specification, claims, abstract, and drawings fully support the amendments to the specification and the addition of new claims 55-108. No new matter was introduced.

If there is any fee due in connection with the filing of this Preliminary Amendment, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: June 12, 2001

By: 

Lawrence F. Galvin
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06-0916-05-1

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